SB761
.U7 N6 no. 71-3

US
FS
NR
Rept.
71-3

U.S. FOREST SERVICE

NORTHERN REGION

DIVISION OF STATE AND PRIVATE FORESTRY

INSECT AND DISEASE REPORT

LIBRARY
PACIFIC FOREST RESEARCH CENTRE
506 WEST BURNSIDE ROAD
VICTORIA, B.C.

Report 71-3 5230

POTENTIAL FOR DEFOLIATION OF WESTERN LARCH BY LARCH CASEBEARER IN THE NORTHERN REGION -- 1971

by

W. M. CIESLA AND W. E. BOUSFIELD

ENTOMOLOGISTS, FOREST INSECT AND DISEASE BRANCH

The larch casebearer, Coleophora laricella (Hbn.) was first discovered infesting western larch, Larix occidentalis Nutt., in 1957 near St. Maries, Idaho. It has since spread throughout most of the western larch forests of Northern Idaho, Northeastern Washington and Western Montana. In recent years, entomologists have observed upward and downward population fluctuations of the casebearer in areas where the insect has been established for several years. Trees suffering branch dieback have recovered slightly when casebearer populations declined. During December 1970, a series of plots were established throughout the insects' range in the Northern Region in an attempt to measure casebearer population trends and forecast defoliation.

METHODS - Webb (1957) reported that levels of overwintering second and third instar casebearer larvae could be estimated and expressed in terms of numbers of larvae per 100 spur shoots. Data collected from 33 plots in the Northern Region during 1969 (Bousfield, Unpublished data) indicated that 38, 100-spur shoot branch samples were required to accurately estimate the population within a standard error of 20% of the mean 9 out of 10 times.

Consequently four branch samples of 100 spur shoots each were collected from midcrown of 10 sample trees with pole pruners at 59 sample points. These were located on the Clearwater, Coeur d'Alene, Colville, Flathead, Kaniksu, Kootenai, Lolo and St. Joe National Forests (Fig. 1). Sample branches were kept separate by plot and tree and returned to the laboratory where counts of overwintering casebearer larvae were made. The 1970 collections were compared with equivalent 1969 data using a "t" test whenever 1969 data were available.

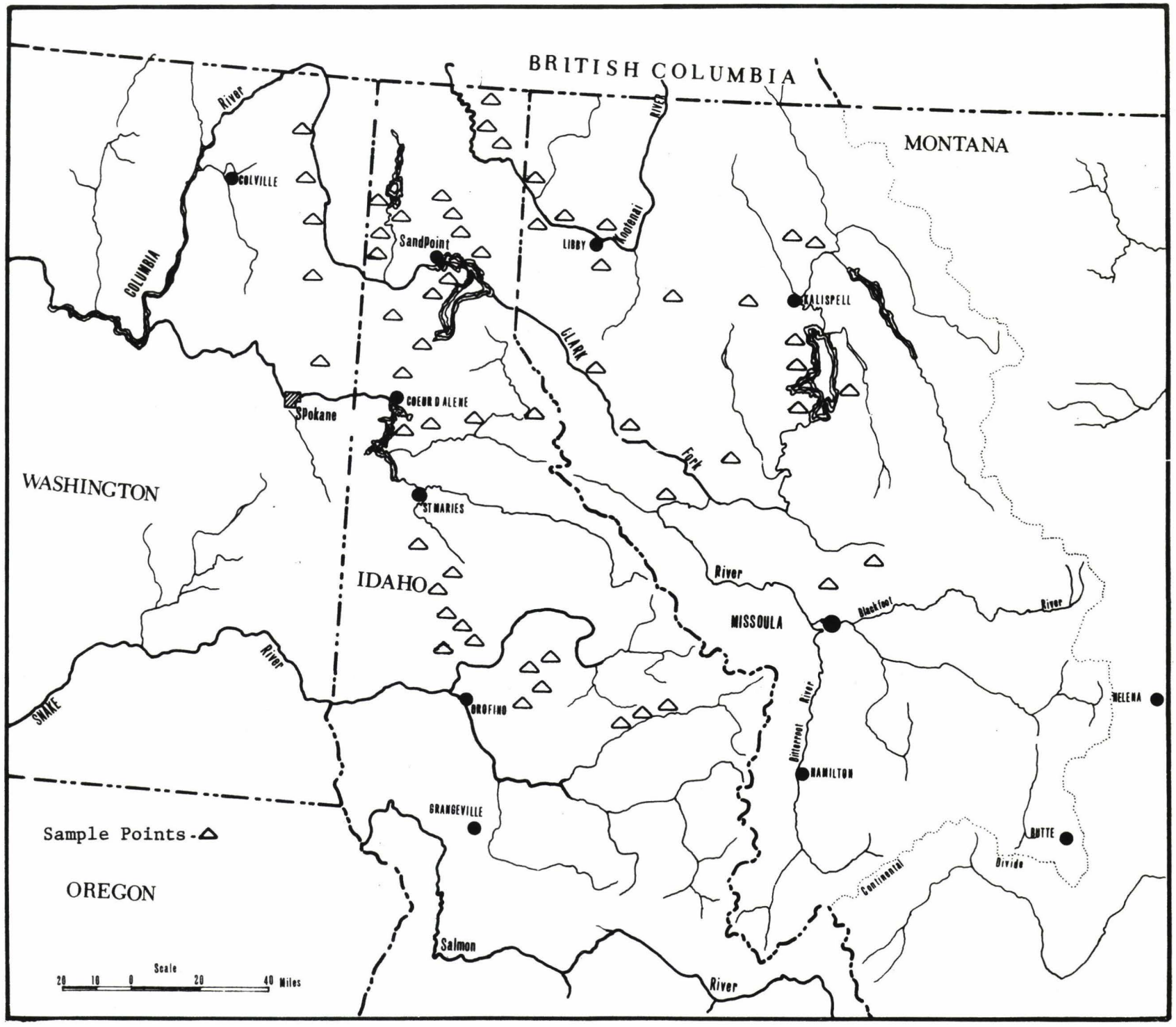

Fig.1- Location of larch casebearer sample plots.

RESULTS - Overwintering casebearer populations ranged from a low of .075 insects per 100 spur shoots at Thompson Falls, Lolo National Forest, Montana, to 209.9 insects per 100 spur shoots at Elk River, St. Joe National Forest, Idaho. Standard errors were within 10 percent of the mean in most cases indicating that the sample size was adequate to estimate population levels. Comparison of 1970 data with available 1969 data using t tests failed to reveal a significant upward or downward trend over large areas. The most complete 1969 data available was from the Kaniksu National Forest. This showed that six plots had significantly greater populations in 1970, five plots had roughly equal populations in 1969 and 1970 and three contained significantly lower populations (Table 1.) The 1970 data indicates that overwintering populations were consistently higher in Idaho than Montana.

Based on these observations we predict that an infestation pattern similar to that which occurred in 1970 will occur during 1971, with heaviest defoliation occurring in Idaho and light to negligible damage occurring in Montana with the exception of the vicinity of Flathead Lake.

Attempts will be made in 1971 to classify defoliation on 1970 sample plots and relate overwintering population densities to defoliation.

LITERATURE CITED:

Webb, F. E. 1957. Sampling techniques for the overwintering stage of the larch casebearer. Canada Dept. Agr. Science Service, Forest Biology Div. Bi-Monthly Progress Rpt. 13 (4): 1-2.

TABLE 1
OVERWINTERING LARCH CASEBEARER POPULATION DENSITY
NORTHERN REGION 1969-1970

State, Forest, Area	Overwintering casebearer per 100 spur shoots						
	1969		1970				
	Mean	S.E.	Mean	S.E.	C.V.	"t" Value	Trend
Washington							
Colville							
Cusic	156.7	14.3	52.5	7.2	.82	7.63	Decline
Tiger Hill	47.6	8.1	63.6	6.1	.61	1.57	Static
Box Canyon	63.1	7.5	49.1	6.6	.85	1.38	Static
Kaniksu							
Sasheen	60.8	8.5	27.3	3.3	.77	3.81	Decline
Spokane Mtn.			37.6	6.8	1.15		
Idaho							
Kaniksu							
Falls	36.3	2.9	140.9	9.0	.40	10.9	Increase
Upper W. Branch	14.4	1.4	26.1	5.2	1.23	2.27	Increase
Priest Lake	4.6	.05	9.5	1.3	.87	3.37	Increase
Coolin	106.0	7.6	41.2	4.7	.72	7.0	Decline
Ruby Creek	84.0	7.7	97.2	7.8	.45	1.28	Static
Colburn	111.7	14.4	98.2	11.5	.74	.74	Static
Gold Creek	291.3	15.0	188.5	14.4	.48	4.94	Decline
Trestle	55.7	6.6	99.2	9.4	.60	3.28	Increase
Garfield Bay	151.0	16.6	88.4	13.7	.98	2.95	Decline
Blacktail	132.9	11.0	67.7	7.9	.74	1.20	Static
Bay View	124.0	17.1	103.0	9.8	.60	1.06	Static
Clagstone	21.1	4.9	43.1	4.6	.68	3.20	Increase
Copeland	63.7	6.1	54.2	5.6	.66	1.13	Static
Smith Lake			47.7	4.2	.55		
Moyie	76.4	8.9	130.8	8.3	.40	4.48	Increase
Clearwater							
Colgate			.37	.12	2.15		
Pack Bridge			3.8	.49	.81		
Eagle Creek			23.3	1.9	.53		
Green Flat			19.9	1.6	.52		
Weippe			10.1	2.8	1.79		
Browns Creek			37.0	5.1	.85		
Snake Creek			179.0	11.2	.39		
Cardiff			69.2	6.5	.59		

Table 1 - continued

State, Forest, Area	1969 Mean	1969 S.E.	1970 Mean	1970 S.E.	1970 C.V.	"t" Value	Trend
Idaho							
St. Joe							
Vista Point			98.2	14.9	.98		
Hidden Creek			92.7	12.3	.85		
Collins Creek			43.5	9.6	1.40		
Boville			41.4	7.4	1.14		
South Boville			69.3	9.0	.82		
Deep Creek			126.5	10.3	.51		
Elk River			209.9	16.4	.49		
Coeur d'Alene							
Lost Creek			1.3	.39	1.89		
Tent Creek			55.9	6.2	.70		
4th of July			51.3	6.3	.84		
Turner Bay	218.7	17.9	160.3	12.6	.49	3.28	Decline
Hayden Creek	82.4	5.3	97.4	8.1	.52	1.51	Static
Montana							
Kaniksu							
Trout Creek	2.67	.06	.55	.13	1.59		Decline
Kootenai							
State Line			51.2	5.3	.59		
Lake Creek	15.9	1.22	35.3	4.2	.76	4.35	Increase
Kootenai Falls			31.5	5.0	1.02		
Rainy Creek			14.3	1.5	.66		
Libby Creek	81.9	7.9	7.3	.64	.55	15.1	Decline
Thompson Lakes	13.8	.43	1.9	.36	1.1		
Lolo							
Evaro	19.2	.51	12.4	1.2	.66	3.27	Decline
Jocko	2.6	.41	1.6	.21	.84	2.04	Decline
Rainbow Lake	.85	.026	.15	.05	2.41		
St. Regis	1.4	.021	.10	.04	3.03		
Thompson Falls	0.125	.022	.075	.042	3.55		
Flathead							
Whitefish			61.6	5.2	.54		
Columbia Falls			66.9	4.8	.45		
Sommers			61.2	5.3	.55		

Table 1 - continued

State, Forest, Area	1969 Mean	1969 S.E.	1970 Mean	1970 S.E.	1970 C.V.	1970 "t" Value	1970 Trend
Montana							
Flathead							
Lakeside	104.0	7.4	49.9	7.0	.89	5.29	Decline
Polson			22.1	3.1	.90		
Cherry Orchards	35.1	3.4	71.9	7.4	.65	4.67	Increase
Sun Valley	16.9	.45	6.7	.67	.62	7.0	Decline